

FORM PTO-1390 (Modified)  
(REV 11-2000)

U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

ATTORNEY'S DOCKET NUMBER

## TRANSMITTAL LETTER TO THE UNITED STATES

DESIGNATED/ELECTED OFFICE (DO/EO/US)

CONCERNING A FILING UNDER 35 U.S.C. 371

32207

U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR

09/980295

INTERNATIONAL APPLICATION NO.

PCT/SE00/01180

INTERNATIONAL FILING DATE

7 June 2000

PRIORITY DATE CLAIMED

10 June 1999

TITLE OF INVENTION

A HOSE DEVICE

APPLICANT(S) FOR DO/EO/US

ALVEBY, Nils

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☐ This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (24) indicated below.
4. ☐ The US has been elected by the expiration of 19 months from the priority date (Article 31).
5. ☒ A copy of the International Application as filed (35 U.S.C. 371 (c) (2))
  - a. ☒ is attached hereto (required only if not communicated by the International Bureau).
  - b. ☐ has been communicated by the International Bureau.
  - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☐ An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).
  - a. ☐ is attached hereto.
  - b. ☐ has been previously submitted under 35 U.S.C. 154(d)(4).
7. ☐ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371 (c)(3))
  - a. ☐ are attached hereto (required only if not communicated by the International Bureau).
  - b. ☐ have been communicated by the International Bureau.
  - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
  - d. ☐ have not been made and will not be made.
8. ☐ An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371 (c)(4)).
10. ☐ An English language translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c)(5)).
11. ☒ A copy of the International Preliminary Examination Report (PCT/IPEA/409).
12. ☒ A copy of the International Search Report (PCT/ISA/210).

## Items 13 to 20 below concern document(s) or information included:

13. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
14. ☒ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
15. ☒ A **FIRST** preliminary amendment.
16. ☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
17. ☐ A substitute specification.
18. ☐ A change of power of attorney and/or address letter.
19. ☐ A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825.
20. ☐ A second copy of the published international application under 35 U.S.C. 154(d)(4).
21. ☐ A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).
22. ☒ Certificate of Mailing by Express Mail
23. ☒ Other items or information:

U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR <div style="font-size: 2em; font-weight: bold; margin-top: 5px;">097/980295</div>		INTERNATIONAL APPLICATION NO. <div style="font-weight: bold; margin-top: 5px;">PCT/SE00/01180</div>		ATTORNEY'S DOCKET NUMBER <div style="font-weight: bold; margin-top: 5px;">32207</div>	
---	--	--	--	--	--

24. The following fees are submitted:				CALCULATIONS PTO USE ONLY	
<b>BASIC NATIONAL FEE ( 37 CFR 1.492 (a) (1) - (5)) :</b> <input checked="" type="checkbox"/> Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO ..... \$1040.00  <input type="checkbox"/> International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO ..... \$890.00  <input type="checkbox"/> International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO ..... \$740.00  <input type="checkbox"/> International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4) ..... \$710.00  <input type="checkbox"/> International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) ..... \$100.00  <div style="text-align: right; font-weight: bold;">ENTER APPROPRIATE BASIC FEE AMOUNT =</div>				<div style="border: 1px solid black; padding: 2px;">\$1,040.00</div>	
Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492 (e)).				<div style="border: 1px solid black; padding: 2px;">\$0.00</div>	
CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total claims	16 - 20 =	0	x \$18.00	\$0.00	
Independent claims	1 - 3 =	0	x \$84.00	\$0.00	
Multiple Dependent Claims (check if applicable) <input type="checkbox"/>				\$0.00	
TOTAL OF ABOVE CALCULATIONS =				\$1,040.00	
<input type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by 1/2.				<div style="border: 1px solid black; padding: 2px;">\$0.00</div>	
SUBTOTAL =				\$1,040.00	
Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492 (f)).				<div style="border: 1px solid black; padding: 2px;">\$0.00</div>	
TOTAL NATIONAL FEE =				\$1,040.00	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31) (check if applicable). <input checked="" type="checkbox"/>				<div style="border: 1px solid black; padding: 2px;">\$40.00</div>	
TOTAL FEES ENCLOSED =				\$1,080.00	
				Amount to be:	\$
				refunded	
				charged	\$

a. ☒ A check in the amount of \$1,080.00 to cover the above fees is enclosed.

b. ☐ Please charge my Deposit Account No. \_\_\_\_\_ in the amount of \_\_\_\_\_ to cover the above fees. A duplicate copy of this sheet is enclosed.


c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 19-0522 A duplicate copy of this sheet is enclosed.

d. ☐ Fees are to be charged to a credit card. **WARNING:** Information on this form may become public. **Credit card information should not be included on this form.** Provide credit card information and authorization on PTO-2038.

**NOTE:** Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.


SEND ALL CORRESPONDENCE TO:

Thomas H. Van Hoozer  
 HOVEY, WILLIAMS, TIMMONS & COLLINS

23589

  
PATENT TRADEMARK OFFICE

  
 SIGNATURE  

Thomas H. Van Hoozer

 NAME  

32,761

 REGISTRATION NUMBER  

November 29, 2001

 DATE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of:

ÄLVEBY, Nils

U.S. National Phase Application of  
International Application Serial No. :  
PCT/SE00/01180

International Filing Date: 7 June 2000

A HOSE DEVICE

Assistant Commissioner of Patents  
Box PCT  
Washington, D.C. 20231

Sir:

**PRELIMINARY AMENDMENT**

Please enter the following preliminary amendment prior to examination of this application on the merits and computation of the fees:

**ABSTRACT**

Applicant submits herewith an abstract of the invention retyped on a separate page in conformance with U.S. practice. The abstract is taken from that appearing on the cover of the published international application.

## CLAIMS

Please amend the claims to read as follows:

1. (Amended) A hose device comprising:

a hose portion;

at least a first end portion;

a channel which extends along the hose device through the first end portion and the hose portion; and

a transition portion which is located between the first end portion and the hose portion,

wherein the hose device has flexible and elastic properties,

wherein the first end portion of the hose device in a mounted state is arranged to be attached

to a tubular connection member by having the connection member introduced in the channel, and

wherein the channel extends through the transition portion and in a non-mounted state has

a non-circular cross-section shape at the transition portion that the channel in the mounted state forms a substantially circular cross-sectional shape.

2. (Amended) A device according to claim 1, wherein the connection member has an end surface, which is obliquely cut, wherein the hose device in the mounted state is arranged to be attached to the connection member in such a way that the connection member extends into the transition portion.

3. (Amended) A device according to claim 1, including a connection member, wherein the connection member has an outer surface, which seen in a cross-sectional view is substantially circular.

4. (Amended) A device according to claim 1, wherein the channel in the non-mounted state has an egg-like cross-sectional shape.

5. (Amended) A device according to claim 1, wherein said cross-sectional shape of the channel forms a first outward portion including a radius (r) and a second outwardly extending portion.

6. (Amended) A device according to claim 2, wherein the hose device is arranged to be located in such a rotary position in relation to the connection member that the second portion in the mounted state is directed toward the obliquely cut end surface.

7. (Amended) A device according to claim 5, wherein said radius (r) is substantially constant.

8. (Amended) A device according to claim 5, wherein the channel has a longitudinal center axis (x), wherein a distance (a) between the second portion and said center axis (x) is larger than said radius (r) seen in a cross-section through the transition portion.

9. (Amended) A device according to claim 8, wherein said distance (a) increases along the transition portion in a direction from the first end portion to a maximum value, whereafter said distance (a) decreases in a direction towards the hose portion.

10. (Amended) A device according to claim 1, wherein the first end portion includes an end surface which has a chamfered portion.

11. (Amended) A device according to claim 10, wherein the cross-sectional shape of the channel forms a first portion and a second portion, and wherein the second portion of the channel and the chamfered portion are located substantially straight after each other seen in the extension of the hose device.

12. (Amended) A device according to claim 1, wherein the hose device, at least at the transition portion, has an outer surface, which seen in a cross-sectional view is substantially circular.

13. (Amended) A device according to claim 1, wherein the hose device at the transition portion has a larger wall thickness than at the first end portion and the hose portion.

14. (Amended) A device according to claim 1, including a bead which extends around the hose device and in the longitudinal direction (x) of the hose device over substantially the whole transition portion.

15. (Amended) A device according to claim 5, wherein the cross-sectional shape of the channel forms a first portion and a second portion, and wherein the bead has a longer extension in the longitudinal direction (x) of the hose device at the second portion than at the first portion.

16. (Amended) A device according to claim 1, wherein the hose device at the outer side is provided with grooves which extend in the longitudinal direction (x) of the hose device over substantially the whole transition portion in such a way that the hose device has a tooth wheel-like shape seen in a cross-section through the transition portion.

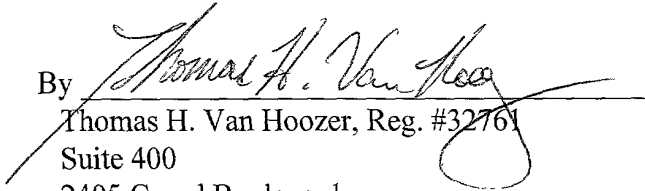
### REMARKS

Applicant submits herewith a Preliminary Amendment for entry prior to computation of the fee and examination of the application on the merits. Applicant believes the amendment submitted herewith conform the application to U.S. practice and in view of the favorable International Preliminary Search Report it is believed that the amendment to the claims place them in allowable form. Should the examiner have any questions which may be resolved by telephone conference, it is requested that the examiner contact applicant's attorney at 1-800-445-3460. Should this amendment necessitate any additional fees it may be charged to Deposit Account No. 19-0522.

Respectfully submitted,

HOVEY, WILLIAMS, TIMMONS & COLLINS

By

  
Thomas H. Van Hoozer, Reg. #32761

Suite 400

2405 Grand Boulevard

Kansas City, Missouri 64108

(816) 474-9050

(Docket No. 32207)

## ABSTRACT

A hose device includes a hose portion (3), at least a first end portion (2) and a channel (5) which extends along the hose device (1) through the first end portion and the hose portion. The hose device has flexible and elastic properties. The first end portion (2) of the hose device is in a mounted state arranged to be attached to a tubular connection member (7) by having the connection member introduced in the channel (5). The hose device has a transition portion (4), which is located between the first end portion (2) and the hose portion (3). The channel (5) thus extends also through the transition portion and has, at the transition portion (4), in a non-mounted state a non-circular cross-sectional shape and in the mounted state a substantially circular cross-sectional shape, which permits a free liquid flow through the channel (5).

Patent Attorney



Applicant: ÄLVEBY, Nils  
Title: A HOSE DEVICE  
U.S. National Phase Application Corresponding  
to PCT/SE00/01180  
Attorney Docket No.: 32207

**MARKED UP COPY OF PRELIMINARY AMENDMENT TO SHOW CHANGES MADE**

Please amend the claims as follows:

1. (Amended) A hose device[including] comprising:  
a hose portion [(3)];  
at least a first end portion [(2)]; [and]  
a channel [(5),] which extends along the hose device through the first end portion [(2)]  
and the hose portion [(3)]; and  
a transition portion which is located between the first end portion and the hose portion,  
wherein the hose device [(1)] has flexible and elastic properties,  
wherein the first end portion [(2)] of the hose device in a mounted state is arranged to be  
attached to a tubular connection member [(7)] by having the connection member  
introduced in the channel [(5)], and  
[wherein the hose device includes a transition portion (4), which is located between the  
first end portion and the hose portion, characterised in that]  
wherein the channel [(5)] extends through the transition portion [(4)] and in a non-  
mounted state has a [such] non-circular cross-section shape at the transition  
portion [(4)] that the channel in the mounted state forms a substantially circular  
cross-sectional shape.
2. (Amended) A device according to claim 1, [characterised in that] wherein the  
connection member [(7)] has an end surface, which is obliquely cut, wherein the hose device  
[(1)] in the mounted state is arranged to be attached to the connection member [(7),] in such a  
way that the connection member extends into the transition portion [(4)].
3. (Amended) A device according to [any one of claims 1 and 2, characterised in  
that] claim 1, including a connection member, wherein the connection member [(7)] has an outer  
surface, which seen in a cross-sectional view is substantially circular.
4. (Amended) A device according to [any one of the preceding claims,  
characterised in that] claim 1, wherein the channel [(5)] in the non-mounted state has an egg-like  
cross-sectional shape.
5. (Amended) A device according to [any one of the preceding claims,  
characterised in that] claim 1, wherein said cross-sectional shape of the channel [(5)] forms a first  
outward portion [(10)] including a radius (r) and a second outwardly extending portion [(11)].

09/980295

Applicant: ÄLVEBY, Nils  
Title: A HOSE DEVICE  
U.S. National Phase Application Corresponding  
to PCT/SE00/01180  
Attorney Docket No.: 32207  
Page 2

6. (Amended) A device according to [claims 2 and 5, characterised in that] claim 2, wherein the hose device [(1)] is arranged to be located in such a rotary position in relation to the connection member [(7)] that the second portion in the mounted state is directed toward the obliquely cut end surface.

7. (Amended) A device according to [any one of claims 5 and 6, characterised in that] claim 5, wherein said radius (r) is substantially constant.

8. (Amended) A device according to [any one of claims 5 to 7, characterised in that] claim 5, wherein the channel [(5)] has a longitudinal [centre] center axis (x), wherein [the] a distance (a) between the second portion [(11)] and said [centre] center axis (x) is larger than said radius (r) seen in a cross-section through the transition portion [(4)].

9. (Amended) A device according to [any one of claims 5 to 8, characterised in that] claim 8, wherein said distance (a) increases along the transition portion [(4)] in a direction from the first end portion [(2)] to a maximum value, whereafter said distance (a) decreases in a direction towards the hose portion [(3)].

10. (Amended) A device according to [any one of the preceding claims, characterised in that] claim 1, wherein the first end portion [(2)] includes an end surface which has a chamfered portion [(9)].

11. (Amended) A device according to [claims 5 and 10, characterised in that] claim 10, wherein the cross-sectional shape of the channel forms a first portion and a second portion, and wherein the second portion [(11)] of the channel [(5)] and the chamfered portion [(9)] are located substantially straight after each other seen in the extension of the hose device.

12. (Amended) A device according to [any one of the preceding claims, characterised in that] claim 1, wherein the hose device, at least at the transition portion [(4)], has an outer surface, which seen in a cross-sectional view is substantially circular.

13. (Amended) A device according to [any one of the preceding claims, characterised in that] claim 1, wherein the hose device at the transition portion [(4)] has a larger wall thickness than at the first end portion [(2)] and the hose portion [(3)].

FILED IN 56208660

[illegible]

16. (Amended) A device according to [any one of the preceding claims, characterised in that] claim 1, wherein the hose device at the outer side is provided with grooves [(14)] which extend in the longitudinal direction (x) of the hose device over substantially the whole transition portion [(4)] in such a way that the hose device has a tooth wheel-like shape seen in a cross-section through the transition portion [(4)].

3/pst

## 5 A HOSE DEVICE

## THE BACKGROUND OF THE INVENTION AND PRIOR ART

- 10 The present invention refers to a hose device including a hose portion, at least a first end portion and a channel, which extends along the hose device through the first end portion and the hose portion, wherein the hose device has flexible and elastic properties, wherein the first end portion of the hose device in a mounted state is arranged to
- 15 be attached to a tubular connection member by having the connection member introduced in the channel and wherein the hose device includes a transition portion, which is located between the first end portion and the hose portion.
- 20 Such hose devices are comprised by a short milk conduit, which normally is manufactured in a rubber-like material and extends between a teatcup and a teatcup claw of a milking member. The short milk conduit may be a separate hose or be a part of a teatcup liner, which is mounted in the shell of
- 25 the teatcup. When the milk conduit is provided on the connection member of the teatcup claw, which normally is designed as an obliquely cut pipe nipple, the inner cross-sectional shape of the milk conduit is deformed in such a way that the cross-sectional area is reduced, i.e. a
- 30 constriction is formed in an area immediately outside the nipple. Such a constriction prevents a free milk flow through the milk conduit.

- 35 The patent literature includes several documents describing such hose devices, which form a short milk conduit between a teatcup and a teatcup claw.

T06627 55003550

US-2,341,953 discloses a short milk hose having a bead which extends radially outwardly from the milk hose immediately outside an obliquely cut connection nipple. The purpose of the bead is to prevent the hose from being damaged when the teatcup is falling downwardly.

US-2,694,379 discloses a teatcup liner hose having a reduced thickness of material in an area immediately outside the connection portion. The purpose of this reduction is to improve the possibility of the hose to close when the teatcup is hanging downwardly.

US-3,643,630 discloses a teatcup liner hose having a bended end, which is intended to be attached to a connection nipple. The purpose of the bended end appears to be to improve the closing capability of the teatcup liner hose and to ensure a free milk flow in a milking position.

## SUMMARY OF THE INVENTION

The object of the present invention is to provide a hose device by which the problems mentioned above may be remedied.

This purpose is obtained by the hose device initially defined, which is characterised in that the channel extends through the transition portion and in a non-mounted state has such a non-circular cross-sectional shape at the transition portion that the channel in the mounted state forms a substantially circular cross-sectional shape. Due to the incompressibility of flexible and elastic materials, including elastomers such as natural and synthetic rubber, it is possible to design the channel with such a non-symmetric, non-circular cross-sectional shape that the deformation mentioned above in the mounted state, i.e. when

the end portion of the hose device is mounted to the connection member, results in a substantially circular cross-sectional shape of substantially the whole transition portion of the channel, i.e. in an area immediately outside the connection member.

According to an embodiment of the invention, the connection member has an end surface, which is obliquely cut, i.e. the end forms an annular end surface which is inclined in relation to a longitudinal centre axis of the tubular connection member, wherein the hose device in the mounted state is arranged to be attached to the connection member in such a way that the connection member extends into the transition portion. Furthermore, the outer surface of the connection member may, seen in a cross-sectional view, be substantially circular.

According to a further embodiment of the invention, said cross-sectional shape of the channel forms a first portion including a radius and a second outwardly extending portion. Such a cross-sectional shape has an egg-like appearance and has proved to form a substantially circular cross-section when the channel receives an obliquely cut pipe nipple, especially when the hose device is positioned in such a rotary position in relation to the connection member that the second portion in the mounted state is directed towards the obliquely cut end surface. Furthermore, said radius may be substantially constant.

According to a further embodiment, the channel has a longitudinal centre axis, wherein the distance between the second portion and said centre axis is larger than said radius seen in a cross-section through the transition portion. Furthermore, said distance may increase along the transition portion in a direction from the first end portion

to a maximum value, whereafter said distance decreases in a direction towards the hose portion.

According to a further embodiment of the invention, the end  
5 portion of the hose device includes an end surface, which  
has a chamfered portion. By such a chamfered portion, which  
may be substantially plane or concave, possibilities are  
created to displace the end surface of the hose device to  
abutment against the outer surface of a teatcup claw even if  
10 the teatcup claw includes projecting portions reducing the  
space being available to the short milk hose. Furthermore,  
by such a chamfered portion, the orientation in the rotary  
direction of the hose device is facilitated when the hose  
device is to be mounted to the connection member. Thereby,  
15 the second portion of the channel and the chamfered portion  
are advantageously located substantially straight after each  
other seen in the extension of the hose device.

According to a further embodiment of the invention, the hose  
20 device has at least at the transition portion an outer  
surface, which, seen in a cross-sectional view, is  
substantially circular. Advantageously, the hose device may  
at the transition portion also have a larger wall thickness  
than at the first end portion and the hose portion. In such  
25 a way, the strength of the hose device is improved in this  
area, which is subjected to wear due to the hose device  
frequently being bent, for instance in a milk conduit  
application. Preferably, the hose device includes a bead,  
which extends around the hose device and in the longitudinal  
30 direction of the hose device over substantially the whole  
transition portion. By giving the bead a longer extension in  
the longitudinal direction of the hose device at the second  
portion than at the first portion, a further strengthening  
of the transition portion is obtained. Such a prolonged bead  
35 over a portion also contributes to the achievement of a  
substantially circular cross-sectional shape of the channel

when the first end portion of the hose device is provided on an inlet nipple of a teatcup claw.

According to a further embodiment of the invention, the hose device is on the outer side provided with grooves, which extend in the longitudinal direction of the hose device over substantially the whole transition portion in such a way that the hose device has a tooth wheel-like shape seen in a cross-section through the transition portion. Such grooves, or more exactly the longitudinal projections extending between the grooves, also contribute to an improved strength of the transition portion, which is subjected to larger bending stresses.

#### BRIEF DESCRIPTION OF THE DRAWINGS

The invention is now to be explained by means of the description of an embodiment and with reference to the drawings attached.

- Fig 1 discloses a perspective view of a hose device according to an embodiment of the invention.
- Fig 2 discloses a longitudinal section of a part of the hose device in Fig 1 in a non-mounted state.
- Fig 3 discloses a cross-section of the hose device along the line III-III in Fig 2.
- Fig 4 discloses a side-view of a part of the hose device in Fig 1.
- Fig 5 discloses a longitudinal section corresponding to the one in Fig 2 in a mounted state.

#### DETAILED DESCRIPTION OF AN EMBODIMENT OF THE INVENTION

Fig 1 discloses a hose device in the form of a teatcup liner 1 for a teatcup of a milking member. The teatcup liner 1 includes an upper part 1a which is intended to be introduced



into a shell of the teatcup, and a lower part 1b, which forms a short milk conduit between the teatcup and a teatcup claw of the milking member. The upper part 1a includes an opening through which the teatcup liner is intended to receive a teat during milking of an animal.

The present invention will now be exemplified with reference to the teatcup liner 1 disclosed even if the invention is applicable to other hose devices intended to be mounted to pipe ends.

The lower part 1b of the teatcup liner 1 includes an end portion 2, a hose portion 3 and a transition portion 4, which is located between the end portion 2 and the hose portion 3, see also Figs 2-4.

The teatcup liner 1 disclosed is manufactured in one piece of a flexible and elastic rubber material. Such rubber materials are substantially incompressible, i.e. the volume of a piece of material remains substantially constant independently of the fact if it is subjected to deformations. This material properties of rubber materials are explained more closely in USE OF RUBBER IN ENGINEERING by P.W. Allen, R.B. Lindley and A-R. Payne; 1967; Maclaren and Sons LTDs, London

The teatcup liner 1 includes a channel 5, which extends through the first end portion 2, the hose portion 3 and the transition portion 4. The channel 5 of the teatcup liner 1 is arranged to transport milk from the teatcup mentioned above to the teatcup claw in order to be supplied therefrom to a milk-collecting member via a long milk conduit.

In a rest position, which is disclosed in Fig 1, the teatcup liner 1 extends along a longitudinal axis x, see Figs 2 and 4. The teatcup liner 1 has a substantially circular shape

seen in a substantially arbitrary cross-section perpendicular to the longitudinal axis x. The longitudinal axis x forms the centre axis of the channel 5 in the first end portion 2 and in the hose portion 3 when the teatcup liner 1 is located in a rest state. The wall thickness of the teatcup liner 1 is substantially constant along the end portion 2 and the hose portion 3. At the transition portion 4, the teatcup liner 1 has a larger wall thickness than at the end portion 2 and the hose portion 3.

The teatcup liner 1 is in a mounted state intended to be attached to a connection member 7 in the form of a pipe nipple. Such a pipe nipple 7 forms an inlet member of the teatcup claw, which is indicated by the reference sign 8 in Fig 5. The teatcup liner 1 is mounted to the pipe nipple 7 by guiding the latter into the channel 5. The pipe nipple 7 has, as appears from Fig 5, an obliquely cut end surface, i.e. the longitudinal axis x is inclined in relation to the end surface by an acute angle  $\alpha$ . The teatcup liner 1 is mounted to the pipe nipple 7 in such a way that the teatcup liner 1 extends to abutment against the outer wall 8a of the teatcup claw 8. The end portion 2 has an end surface, which is provided with a chamfer 9. As appears from Fig 5, the chamfer 9 will abut an outer surface 8b of the teatcup claw. This outer surface 8b defines a portion of the teatcup claw 8, which extends upwardly from the outer wall 8a and which is arranged to include different functions, such as for instance a closing valve. The chamfer 9 may be a substantially plane surface or a curved, concave surface. Consequently, the chamfer 9 permits, in the example disclosed, the teatcup liner 1 to be displaced to abutment against the outer wall 8a of the teatcup claw 8, and thus a defined position of the pipe nipple 7 in the channel 5 in the longitudinal direction of the teatcup liner is defined when the teatcup liner 1 is in the mounted state which is disclosed in Fig 5.

In the mounted state, the end surface of the pipe nipple 7 thus is located in the transition portion 4. More precisely, an outer point of the end surface of the pipe nipple 7 is located at a part of the transition portion 4, which adjoins the hose portion 3 and an inner point of the end surface of the pipe nipple 7, i.e. a point, which is located more closely to the teatcup claw 8, at a part of the transition portion 4, which adjoins the end portion 2. The end surface or opening of the pipe nipple 7 thus extends over a substantial part of the transition portion 4.

As appears from Figs 2 and 3, the channel 5 has in the non-mounted state a non-circular cross-sectional shape at the transition portion 4. More precisely, the channel 5 has an egg-like cross-sectional shape having a first portion 10, which has a substantially constant radius  $r$  and an outwardly extending second portion 11. The distance  $a$  from the channel wall of the second portion 11 to the longitudinal axis  $x$  is greater than the radius  $r$  seen in an arbitrary cross-section through the transition portion 4. More precisely, this distance  $a$  is not constant but increases from a value which is equal to the radius  $r$  to a maximum value, which is disclosed in Fig 3, and decreases again to the value of the radius  $r$ . Preferably, the channel wall of the second portion 11 has a radius, which is less than the radius  $r$  and the centre point of which is displaced from the longitudinal axis  $x$  in a direction towards the second portion 11. At the second portion 11, the teatcup liner 1 thus has a smaller wall thickness than at the first portion 10 seen in a cross-section through the transition portion 4. From Fig 2 also appears that the maximum value of the distance  $a$  is changed in the longitudinal direction  $x$  of the teatcup liner 1 from a value corresponding to the radius  $r$  in a border area between the hose portion 3 and the transition portion 4 to a maximum value and decreases again to the value of the radius

r in a border area between the transition portion 4 and the end portion 2. Thanks to the proposed cross-sectional shape of the transition portion 4 in the non-mounted state, substantially the whole channel 5 will have, when the teatcup liner 1 is mounted to the pipe nipple 7, a substantially circular cross-sectional shape, compare Fig 5.

In order to achieve a shape as circular as possible in the channel 5 in the proximity of the pipe nipple 7, the end surface or the opening of the pipe nipple 7 is provided in such a manner that it faces the second portion 11 of the channel 5. Consequently, it is essential that the teatcup liner 1 may be oriented not only in the longitudinal direction but also in a suitable rotary position. Such a orientation is facilitated by the chamfer 9, which advantageously may be provided in such a way that it is located in the same angle position as the second portion 11 in relation to the longitudinal axis x.

As appears from Figs 1, 2, 4 and 5, the teatcup liner 1 includes a bead 13, which extends around the teatcup liner 1 and in the longitudinal direction of the teatcup liner 1 along the longitudinal axis x over substantially the whole transition portion 4. The bead 13 includes a bead portion 13', which along a part of the periphery of the transition portion 4 has a prolonged extension in the longitudinal direction x of the teatcup liner 1. This prolonged bead portion 13' is located at the second portion 11, i.e. the first portion 10. As appears from Figs 1 and 4, the teatcup liner 1 is at the transition portion 4, i.e. on the bead 13, provided with longitudinal recesses or grooves 14 on the outer side in such a way that the teatcup liner has a tooth wheel-like shape seen in a cross-section through the transition portion 4. The grooves 14 extend substantially parallel to each other and to the longitudinal axis x, and a longitudinal projection 15 is formed between adjacent

grooves 14. The grooves 14 are not disclosed in Figs 2, 3 and 5.

5 The present invention is not limited to the embodiment disclosed but may be varied and modified within the scope of the following claims. It is in particular to be noted that the invention also is applicable to other hose devices than teatcup liners 1. For instance, it may be applied to the long milk conduit between the teatcup claw and the milk-  
10 collecting member, or to other hoses of a milking machine or other hoses, which are not intended to transport milk but other liquids and/or gases.

TEATCUP LINER

Claims

1. A hose device including a hose portion (3), at least a first end portion (2) and a channel (5), which extends along the hose device through the first end portion (2) and the hose portion (3), wherein the hose device (1) has flexible and elastic properties, wherein the first end portion (2) of the hose device in a mounted state is arranged to be attached to a tubular connection member (7) by having the connection member introduced in the channel (5) and wherein the hose device includes a transition portion (4), which is located between the first end portion and the hose portion, characterised in that the channel (5) extends through the transition portion (4) and in a non-mounted state has a such non-circular cross-sectional shape at the transition portion (4) that the channel in the mounted state forms a substantially circular cross-sectional shape.
2. A device according to claim 1, characterised in that the connection member (7) has an end surface, which is obliquely cut, wherein the hose device (1) in the mounted state is arranged to be attached to the connection member (7) in such a way that the connection member extends into the transition portion (4).
3. A device according to any one of claims 1 and 2, characterised in that the connection member (7) has an outer surface, which seen in a cross-sectional view is substantially circular.
4. A device according to any one of the preceding claims, characterised in that the channel (5) in the non-mounted state has an egg-like cross-sectional shape.
5. A device according to any one of the preceding claims, characterised in that said cross-sectional shape of the

channel (5) forms a first portion (10) including a radius (r) and a second outwardly extending portion (11).

6. A device according to claims 2 and 5, characterised in that the hose device (1) is arranged to be located in such a rotary position in relation to the connection member (7) that the second portion in the mounted state is directed towards the obliquely cut end surface.
7. A device according any one of claims 5 and 6, characterised in that said radius (r) is substantially constant.
8. A device according to any one of claims 5 to 7, characterised in that the channel (5) has a longitudinal centre axis (x), wherein the distance (a) between the second portion (11) and said centre axis (x) is larger than said radius (r) seen in a cross-section through the transition portion (4).
9. A device according to any one of claims 5 to 8, characterised in that said distance (a) increases along the transition portion (4) in a direction from the first end portion (2) to a maximum value, whereafter said distance (a) decreases in a direction towards the hose portion (3).
10. A device according to any one the preceding claims, characterised in that the first end portion (2) includes an end surface which has a chamfered portion (9).
11. A device according to claims 5 and 10, characterised in that the second portion (11) of the channel (5) and the chamfered portion (9) are located substantially straight after each other seen in the extension of the hose device.

12. A device according to any one of the preceding claims, characterised in that the hose device at least at the transition portion (4) has an outer surface, which seen in a cross-sectional view is substantially circular.

5

13. A device according to any one of the preceding claims, characterised in that the hose device at the transition portion (4) has a larger wall thickness than at the first end portion (2) and the hose portion (3).

10

14. A device according to any one of the preceding claims, characterised by a bead (13), which extends around the hose device and in the longitudinal direction (x) of the hose device over substantially the whole transition portion (4).

15

15. A device according to claims 5 and 14, characterised in that the bead (13) has a longer extension in the longitudinal direction (x) of the hose device at the second portion (11) than at the first portion (10).

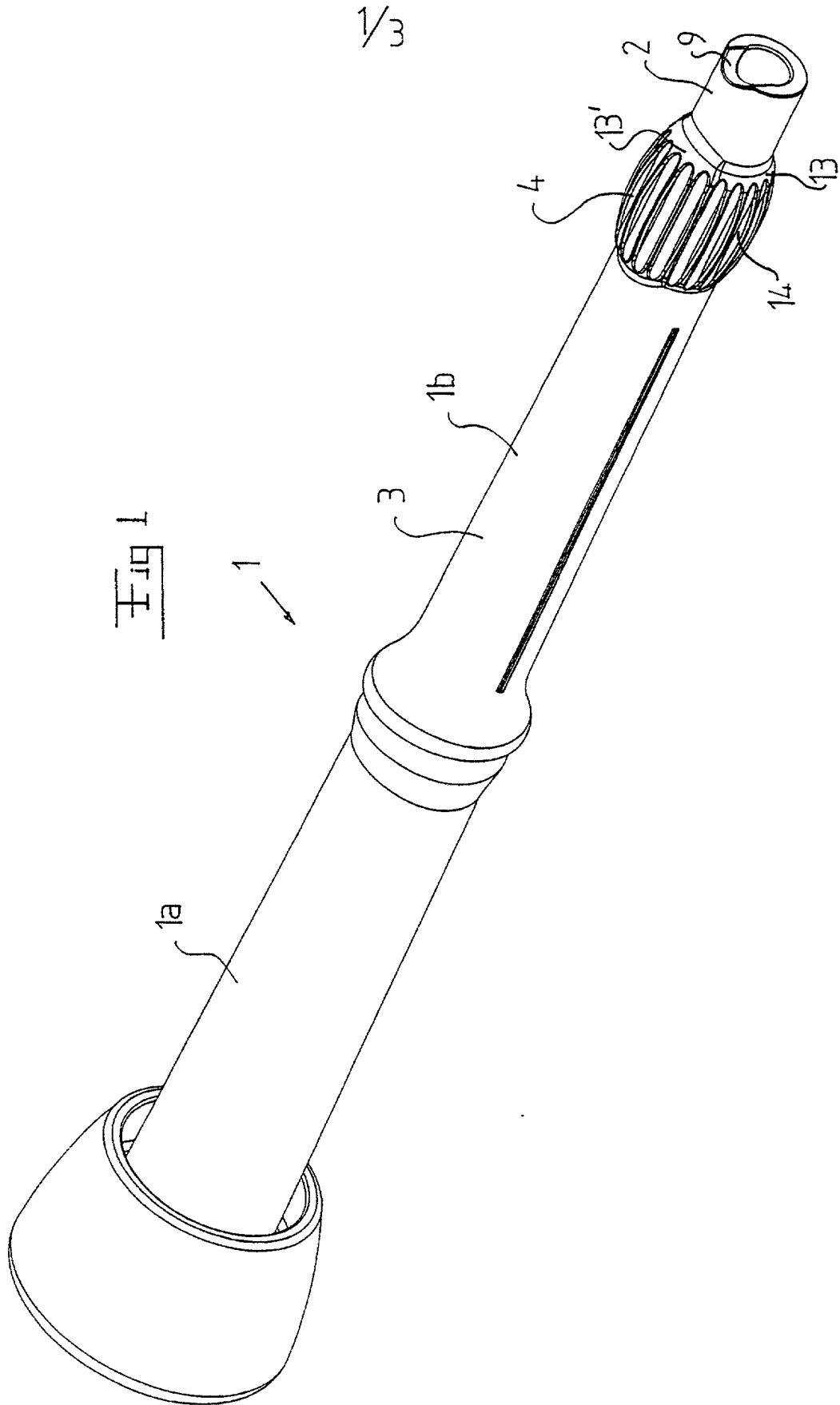
20

16. A device according to any one of the preceding claims, characterised in that the hose device at the outer side is provided with grooves (14) which extend in the longitudinal direction (x) of the hose device over substantially the whole transition portion (4) in such a way that the hose device has a tooth wheel-like shape seen in a cross-section through the transition portion (4).

25

T0627 55202660





2/3

Fig 2

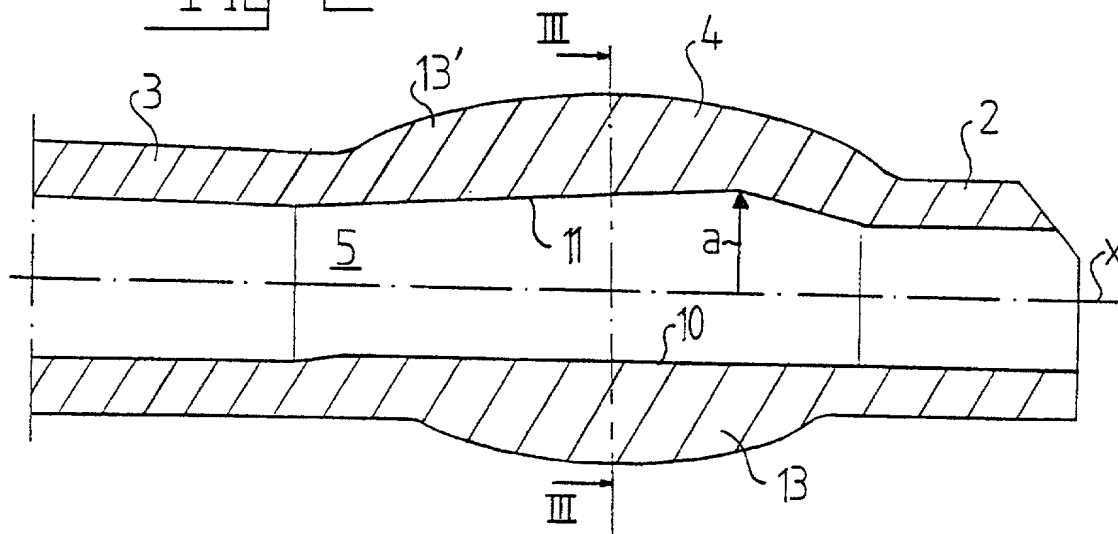


Fig 3

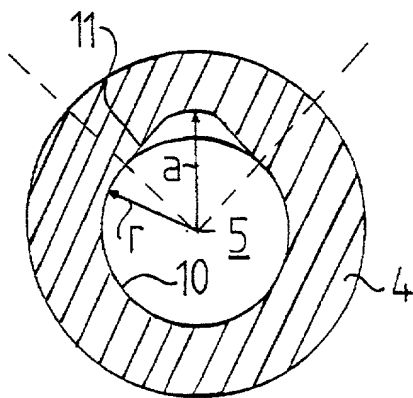
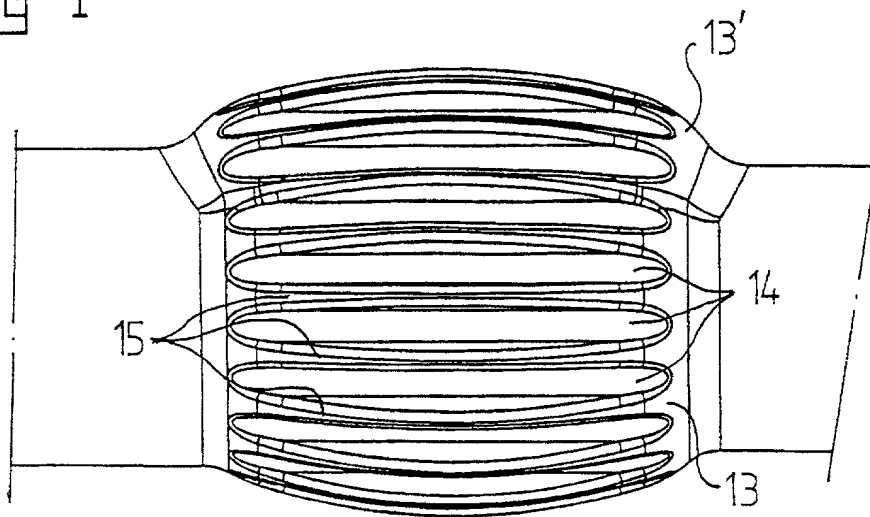


Fig 4



3/3

Fig 5

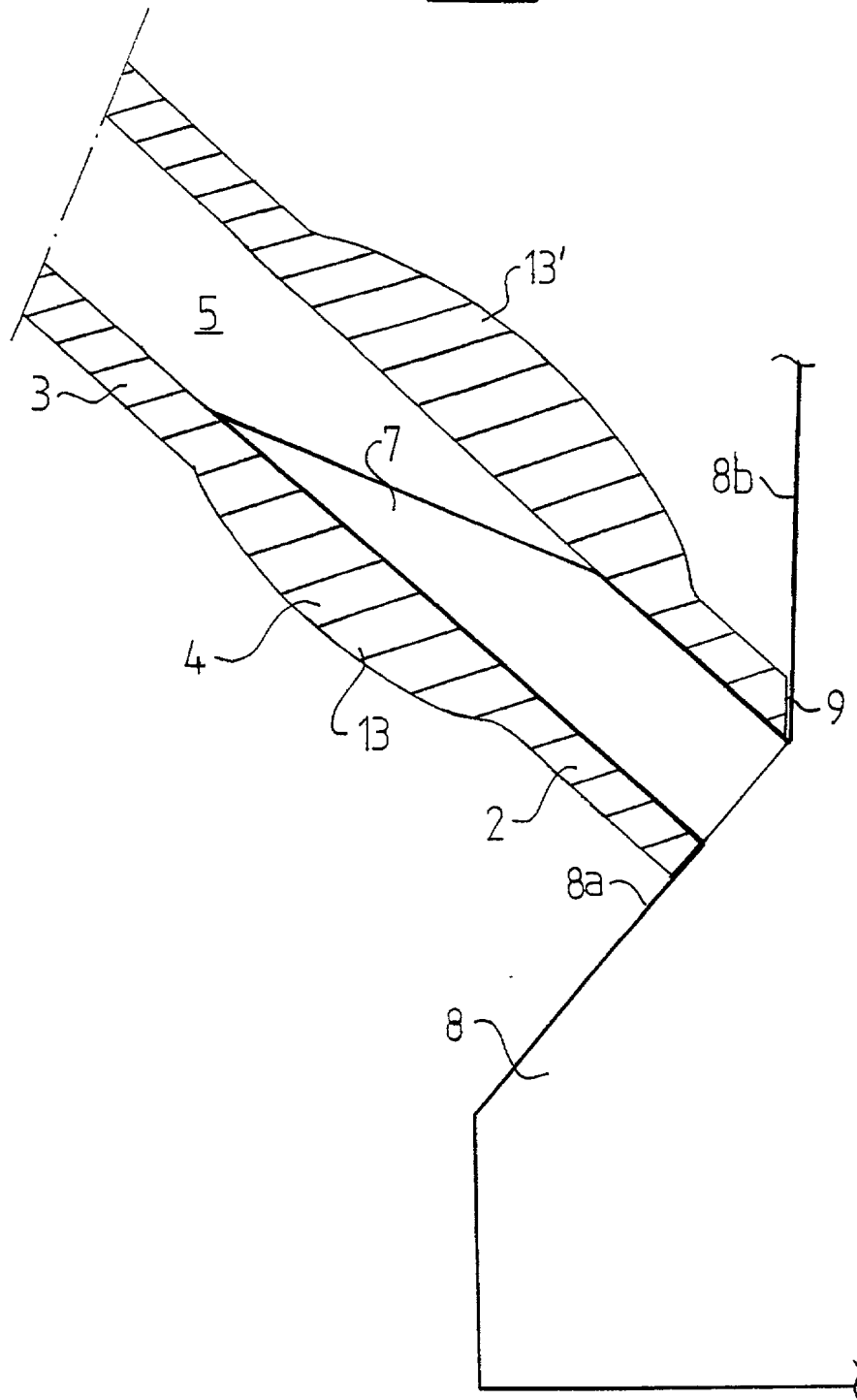


FIG. 5

**Combined declaration for patent application and power of attorney (continued)**  
 (includes Reference to PCT International Applications)

Attorney's docket No.

**PRIOR U.S. APPLICATIONS OR PCT INTERNATIONAL APPLICATIONS DESIGNATING THE U.S. FOR BENEFIT UNDER 35 U.S.C. 120:**

U.S. APPLICATIONS		STATUS (Check one)		
APPLICATION NO.	U.S. FILING DATE	PATENTED	PENDING	ABANDONED
PCT APPLICATIONS DESIGNATING THE U.S.				
APPLICATION NO.	FILING DATE	US SERIAL NO. ASSIGNED (if any)		
PCT/SE00/01180	7 June 2000			

**POWER OF ATTORNEY:** As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. (List name and registration number):

Robert D. Hovey	19,223	Thomas B. Luebbering	37,874
Warren N. Williams	19,156	Andrew G. Colombo	40,565
Stephen D. Timmons	26,513	Tracy Borman	42,347
John M. Collins	26,262	Tracey S. Truitt	43,205
Thomas H. Van Hoozer	32,761		

Customer no 23559

Send correspondence to:  
**HOVEY, WILLIAMS, TIMMONS & COLLINS**  
 2405 Grand, Suite 400  
 Kansas City, Missouri 64108

Direct telephone calls to:  
 (816) 474-9050

FULL NAME OF INVENTOR (201)	FAMILY NAME	FIRST GIVEN NAME	SECOND GIVEN NAME
	Ålveby	Nils	
RESIDENCE & CITIZENSHIP	CITY	STATE OR FOREIGN COUNTRY	COUNTRY OF CITIZENSHIP
	Stockholm	Sweden	Sweden
POST OFFICE ADDRESS	POST OFFICE ADDRESS	CITY	STATE & ZIP CODE/COUNTRY
	Anders Reimers väg 13	Stockholm	SWEDEN-117 50
FULL NAME OF INVENTOR (202)	FAMILY NAME	FIRST GIVEN NAME	SECOND GIVEN NAME
RESIDENCE & CITIZENSHIP	CITY	STATE OR FOREIGN COUNTRY	COUNTRY OF CITIZENSHIP
POST OFFICE ADDRESS	POST OFFICE ADDRESS	CITY	STATE & ZIP CODE/COUNTRY
FULL NAME OF INVENTOR (203)	FAMILY NAME	FIRST GIVEN NAME	SECOND GIVEN NAME
RESIDENCE & CITIZENSHIP	CITY	STATE OR FOREIGN COUNTRY	COUNTRY OF CITIZENSHIP
POST OFFICE ADDRESS	POST OFFICE ADDRESS	CITY	STATE & ZIP CODE/COUNTRY

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

SIGNATURE OF INVENTOR 201	SIGNATURE OF INVENTOR 202	SIGNATURE OF INVENTOR 203
DATE	DATE	DATE
26 NOV 01		

**COMBINED DECLARATION FOR PATENT APPLICATION AND POWER OF ATTORNEY**  
(includes Reference to PCT International Applications)

Attorney's docket No.

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

A HOSE DEVICE

the specification of which (check only one item below):

☐ is attached hereto.☐ was filed as United States application.

Serial No. \_\_\_\_\_

on \_\_\_\_\_

and was amended

on \_\_\_\_\_

(if applicable).

☒ was filed as PCT international application

Number PCT/SE00/01180 \_\_\_\_\_

on 7 June 2000 \_\_\_\_\_

and was amended under PCT Article 19

on \_\_\_\_\_

(if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed.

**PRIOR FOREIGN/PCT APPLICATION(S) AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. 119:**

COUNTRY (if PCT indicate PCT)	APPLICATION NO.	DATE OF FILING (day, month, year)	PRIORITY CLAIMED UNDER 35 U.S.C. 119
			<input type="checkbox"/> YES <input type="checkbox"/> NO
Sweden	9902183-4	10 June 1999	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
			<input type="checkbox"/> YES <input type="checkbox"/> NO

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) or PCT international application(s) designating the United States of America that is/are listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in that/those prior application(s) in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application(s) and the national or PCT international filing date of this application;